

Listening for a Lifetime: Protecting Your First Instrument

by Alexander Wright

A practical, evidence-grounded guide for musicians, engineers, and producers who want to work at a high level for decades—without sacrificing the joy of sound. It captures the framework used at Alexander Wright Mastering and offers it freely as a public resource.

TL;DR — Five Habits That Change Tomorrow’s Ears

1. Default to **78–82 dB(C)** at the chair; do short, deliberate loud checks only.
2. Take 10 minutes of silence per hour; after loud days, give ears **18–24 hours** of relative quiet.
3. Wear **musician-grade earplugs** (universal or custom); keep spares everywhere.
4. Track exposure: log **loud days**, show SPLs, and schedule **annual audiograms** (same clinic).
5. Treat **low-end control** and **level-matching** as hearing-conservation tools.

Why Engineers Are a Special Case

Occupational standards like **OSHA** and **NIOSH** were written for industrial safety, not artistic longevity. They aim to preserve conversational hearing at retirement age—tolerating losses that would be disastrous for mix translation. For music professionals, these limits are a **floor**, not a goal.

Hearing fatigue accumulates: rehearsals, commutes, playback, live shows. Damage often begins as **synaptic loss** (“hidden hearing loss”), which doesn’t show up on a standard speech-range audiogram. A person can

“pass” clinical tests and still miss high-frequency detail essential to mixing or mastering.

Longitudinal research confirms the risk:

- **4× higher incidence** of noise-induced hearing loss in professional musicians and engineers compared with the general population.
- **~57% higher prevalence** of tinnitus.

The takeaway: hearing care for artists must exceed workplace standards. Do you want to detect the bare minimum or the highest quality?

Level, Duration, and the Real-Life Line

NIOSH recommends a 3 dB exchange rate (every 3 dB increase halves safe exposure time).

Level (A/C-weighted*)	Max Duration (no plugs)
85 dB (busy traffic in-room)	≈ 8 hours (fresh ears)
94–95 dB (amped rehearsal)	≈ 1 hour
100 dB (small live room, drums nearby)	≈ 15–20 minutes
110 dB (snare up close / PA sweet spot)	≈ 1–2 minutes

*The free **NIOSH Sound Level Meter** app is sufficiently accurate for real-world checks.

Practical cues:

- If you must **raise your voice** at arm’s length, it’s already too loud to linger unprotected.
- If the world sounds **muted** or **rings** afterward, count that day as an overdraft—repay with quiet.

The Floyd Toole Lesson — Bias, Monitoring, and Your Ears

In blind, level-matched tests at the **CBC** and later **Harman**, researcher **Dr. Floyd Toole** demonstrated how quickly even experts adapt to biased monitors—“favorites” collapse when level is matched, and neutral systems prevail. The point wasn’t to embarrass anyone; it revealed how fast perception normalizes error.

Our ears adapt the same way. A small 6–8 kHz notch or trace distortion can influence judgment unconsciously. Unless we **measure and reset**, we end up mixing into our own bias.

Self-Calibration Protocol:

- Establish a baseline and get an **annual audiogram** (request extended high-frequency testing).
- Keep a short **listening log**: brittle cymbals? drifting sibilance? improved translation after rest?
- If tonal tendencies repeat across sessions, assume **your ear moved**, not the world—reset level, take a quiet day, re-measure.

Protection That Preserves Clarity

Foam plugs beat nothing, but they skew balance and dull top-end perception. Better options:

- **Universal musician plugs** (\$15–\$30): relatively flat filters; keep a pair in every bag.
- **Custom-molded plugs** (\$115–\$200): swappable 9/15/25 dB filters; comfortable for hours—the professional standard.
- **IEMs for stage**: isolation creates the quietest stage and allows mixing at safer levels. Don't overdo IEM levels—a dab'll do ya.

Technique: roll, lift the ear, relax jaw, seat deeply.

Redundancy: customs at the studio, universals on the keychain, foam in the travel kit. The best plug is the one you actually have and use.

Studio Hygiene That Keeps You Honest

- Maintain **78–82 dB(C)** as a default mastering level. Make choices at the low end of comfort.
- **Ten-minute silence breaks** each hour—blood flow and novelty reset perception.
- Control the **low end**: excess LF masks detail and accelerates fatigue.
- Alternate **references**: speakers ↔ headphones, loud ↔ quiet. Catch drift early.
- **Log exposure**: mark loud days, rehearsals, and travel noise.

None of this is glamorous but all of it costs far less than losing the top octave. Protecting your hearing is really just protecting your capacity for honest perception.

Recovery Is Part of the Job

After a loud session or show, give your ears **18–24 hours** of relative quiet. If you wake with muffled perception or a new tone, **take the quiet day**. Sleep, hydrate, and let the auditory system reset. Recovery days aren't indulgence—they're maintenance.

Talking to Bands & Clients (Without Killing the Vibe)

Frame protection around sound quality:

- “Custom plugs let us hear the snare transient instead of the room.”
- “Drop the stage 6 dB and I can give you more vocal detail—your roughs will translate better.”
- “Try these plugs for two songs—see if your groove tightens.”

Musicians will do almost anything for better sound: use that.

A Quick Word on Tinnitus

Common in the field and manageable. Don't bury it with extra noise; respect stress (the two amplify each other); and consult a **musician-focused audiologist**. The goal is to keep it **boring** and your process stable.

What to Measure (and What to Ignore)

- **Measure:** calibrated SPL at the chair, show/rehearsal levels, loud-day count, and annual audiograms.
- **Ignore:** anyone treating OSHA limits as “targets” for art.
- Set your own benchmark: **“Hear 16 kHz when I’m old.”**

Sources & Further Reading

This document synthesizes:

- **NIOSH** and **OSHA** exposure frameworks (8-hour / 90 dB base, +3 dB = half exposure).
- **WHO** 2018 Environmental Noise Guidelines.
- Psychoacoustic and perceptual research from **Toole, Olive, and AES** listening studies.
- Modern reviews on hidden hearing loss and neural fatigue in musicians (Liberman et al., 2016–2023).
- Noise-Induced hearing loss among professional musicians (G. Pouryaghoub, R. Mehrdad, S. Pourhosein, Journal of Occupational Health, Volume 59, Issue 1, January 2017)

For a reliable SPL meter: the **NIOSH SLM app** (free, iOS) closely matches professional Type 1 meters. For Android, free apps like Decibel X or Sound Meter provide usable readings when calibrated.

About Alexander Wright Mastering

Independent, high-end boutique mastering studio. Listening as care; consistency over bravado; translation over spectacle.

4% of all mastering revenue supports secular humanitarian and environmental organizations.

© Alexander Wright Mastering, 2025

Creative Commons Attribution–NonCommercial (CC BY-NC 4.0)

Freely share, cite, and adapt this guide.

Protect the art by protecting the ears that make it.

